

Calculation

The settings and the execution of a calculation is made in imos 11.0 on the different tabs of the imos Organizer.

In this document the functions as well as calculation types are explained on the basis of simple examples

It should be noted that for the calculation only **articles** will be considered. Elements that have been inserted via the **Free Construction**, and have not been summarized subsequently in article, are not calculated.

The document is based on the imos Organizer version 11.0.01.49



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1. General overview

The Organizer and the Element Manager enables to calculate projects and define the corresponding calculation principles. In this document the functions plus calculation types are explained on the basis of simple examples.

Before performing a correct calculation, the cost center, operations and routings as well as calculation principles must be defined.

The functions of the calculation are optional and not included in the basis version of the Organizer.

It should be noted that for the calculation only articles will be considered. Elements that have been inserted via the **Free Construction**, and have not been summarized subsequently in article, are not calculated.

2. Explanation of the tabs in the Organizer

2.1 Tab Content

The information for the selected project or order is shown on the tab **content**.
Following information is displayed in the grid:

Function	Explanation
Order	Name of the order.
Quantity	The quantity is defined with 1 by default, but can be still manually modified. For modifying the quantity, click in the grid and enter the desired quantity in the blue field. At the same time the overall costs change as well.
Costs	The costs for an order. The value derives from the column Gross SP in the tab positions .
Overall costs	The overall costs differ from the costs if the quantity is unequal 1.

2.2 Tab Orderlines

The tab **Orderlines** can be activated by marking an order with a double click on tab **content** or by selecting the function **Show Content** in the menu.

All positions of the selected order are listed in a grid on the tab **positions**.


Order\Getting Started\Modern_kitchen														
Processor		Commission Article Designer Planning			Client imos		Purchase Item ID 001			Cost Total 835,32 €				
Orderlines Head Data Customer Data Calculation Principle Dashboard														
Pictu	Hierarchy	Posit	Name	Quantity	Cost	Original SP	Discount %	Discount V	SP Piece	Total SP	VAT %	Sales Tax	Margin	Gross Price
	001		BC_Corner_90x90_1FI	1	61,22 €	67,34 €	0,00 %	0,00 €	67,34 €	67,34 €	0,00 %	0,00 €	10,00 %	67,34 €
	002		BC_1B_1SD	1	71,77 €	78,95 €	0,00 %	0,00 €	78,95 €	78,95 €	0,00 %	0,00 €	10,00 %	78,95 €
	003		BC_1B_1DD	1	116,28 €	127,90 €	0,00 %	0,00 €	127,90 €	127,90 €	0,00 %	0,00 €	10,00 %	127,90 €
	004		BC_1B_1SD	1	71,77 €	78,95 €	0,00 %	0,00 €	78,95 €	78,95 €	0,00 %	0,00 €	10,00 %	78,95 €

The following columns are listed here:

Function	Meaning	Explanation
Picture	Preview	Shows a preview for the position. If a picture has not been defined for the position, then this can be subsequently allocated via the function select picture.
Position		Firstly, an icon is displayed to show if the element is an article, a position, a discount or a text. Additionally, the position numbers defined in CAD are displayed.
Name		Name of the element. Freely editable for positions, discounts and texts.



To show and hide columns mark the header with a right mouse click and select or deselect the appropriate hooks.

Function	Meaning	Explanation
Short description		Freely editable text field.
Quantity		The specified quantity can be edited here. However, the quantity change has only an effect on the calculation of the order and not on the quantity in the bill of materials.
Costs*		<p>The costs are only calculated if the calculation is activated! They depend on which type of calculation has been applied. The calculation type can be defined via the calculation principle.</p> <p>Overhead calculation: Material costs + Material overhead costs + Production costs + production overhead costs and ext. production overhead costs</p> <p>Material overhead calculation: Direct material costs x Material overhead factor / 100</p> <p>Article calculation: Price from the Catalog price in the Article Designer.</p>
Original SP	Sales costs Original	<p> The Original SP is only calculated if the calculation is activated!</p> <p>The value depends on which type of calculation has been applied. The calculation type can be defined via the calculation principle.</p> <p>Overhead calculation: Costs + surcharge [%] (profit, percentage, administrative and sales overhead costs, special costs, sales and marketing, trade discount)</p>
Discount in %		Can be individually adjusted.
Discount Value	Gross discount	Original SP/100 x discount in %



Function	Meaning	Explanation
SC Piece	Sales cost per item	Original SP – discount or This field can also be filled without calculations. Click with the mouse in the field and enter the desired value for a manual definition.
Total SP	Sales cost total	Quantity x SC piece
VAT in %	Value added tax in percent	Can be defined by the customer or individually adjusted by changing the value in the grid.
Sales Tax	Gross VAT	SC piece/100 x VAT in %
Margin	Profit margin	(SC piece – costs) / costs The margin can only be calculated if the calculation is activated!
Gross Price	Sales costs Gross	Total SP + Sales Tax

2.3 Tab Calculation Principle

The settings of the calculation principle define the calculation on the tab **Orderlines**.
 Either a principle from the pulldown menu or from the Element Manager can be selected.

STANDARD

Name	Value
Calculation Principle	
Comment	
Set as Default	<input checked="" type="checkbox"/>
Overhead Calculation	
Material Overhead Cost	15,00
Manufacturing Overhead Cost	35,00
External Manufacturing Cost	0,00
Profit	10,00
Commission	0,00
Administration/Distribution Overhead	0,00
Special Distribution Cost	0,00
Trade Discount	0,00
Material overhead calculation	
Material overhead factor	400,00
Catalog price calculation	
Price from field #	Price field 1
View price fields	
Price field from	Overhead Calculation

Element Manager

Orderlines Head Data Customer Data Calculation Principle Dashboard

Principle name STANDARD

Name	Value
Overhead Calculation	
Material Overhead Cost	15,00
Manufacturing Overhead Cost	35,00
External Manufacturing Cost	0,00
Profit	10,00
Commission	0,00
Administration/Distribution Overhead	0,00
Special Distribution Cost	0,00
Trade Discount	0,00
Material overhead calculation	
Material overhead factor	400,00
Catalog price calculation	
Price from field #	Price field 1
View price fields	
Price field from	Overhead Calculation

Acquisition

Explanation of the tabs in the Organizer



The selected principle can be order-related adjusted.

Contents Head data Customer Data Calculation Principle Dashboard

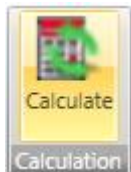
Principle name STANDARD ... *The calculation principle was changed order-related.*

+ %

Name	Value
Overhead Calculation	
Material Overhead Cost	20,00



After modifying the calculation principle or individual order related settings in the principle, the calculation must always be manually restarted to apply the setting. For this purpose, take the function **calculate** in the menu



3. Calculation elements in the Element Manager

3.1 Calculation principle

The settings of the calculation principle are included in the overhead calculation, the Material overhead calculation as well as the article calculation.

Calculation principle

Function	Explanation
Comment	Freely editable text field.
Set as standard	If another principle is not explicitly selected, then this principle is applied for the calculation.

Overhead Calculation

Function	Explanation
Material overhead costs	Surcharge percentage on the direct material costs.
Production overhead costs	Surcharge percentage on the direct production costs.
External production costs	Surcharge percentage on the production costs.
Profit	Surcharge percentage on the manufacturing costs.
Commission	Surcharge percentage on the manufacturing costs.
Administration and sales overhead costs	Surcharge percentage on the manufacturing costs.
Special costs of the sales department	Surcharge percentage on the manufacturing costs.
Trade discount	Discount percentage on the manufacturing costs.

Material overhead calculation

Function	Explanation
Material overhead factor	The material overhead calculation is the overhead percentage on the direct material costs. The resulting price is listed in the tab orderlines in the Organizer.

Catalog price calculation

Function	Explanation
Price from field	The catalogue price can be taken for calculating the price with the article calculation defined via the Article Designer in imos. In imos 3 prices can be saved for an article. Which of these prices are taken for the calculation is defined by the field price from field .

View price fields

Function	Explanation
Price fields from	The type of calculation is defined here. Following calculations can be performed: <ul style="list-style-type: none"> • Overhead calculation • Material overhead calculation • Catalog price calculation

3.2 Cost center

A **cost center** is the allocation of costs to an operational organisation unit which defines the rates for a production unit. Cost centers are allocated to the work steps.

Function	Explanation
Comment	Freely editable text field.
Costs	Costs per unit. Then the unit can also be defined separately.
Currency	Currency of the cost center.
Unit	The unit has an influence on the costs. By default the costs are defined per hour . Optionally it is possible to change the unit.

3.3 Operations

Operations define an operation process. Operations are defined by the allocated cost centers and the entered time. Operations are allocated to a routing.



If the **operation** is the machining type, then this **operation** is automatically allocated to the imos object containing this machining. This means that the costs for this **operation** are automatically included in the calculation.

Work step

Function	Explanation
Type	The type of the work step is important for the following allocation to the operation.
Comment	Freely editable text field.
Cost center	Allocation of the cost center
Calculation factor	The entered value is used as a multiplier for calculating the costs. This factor is multiplied with the costs.

Time

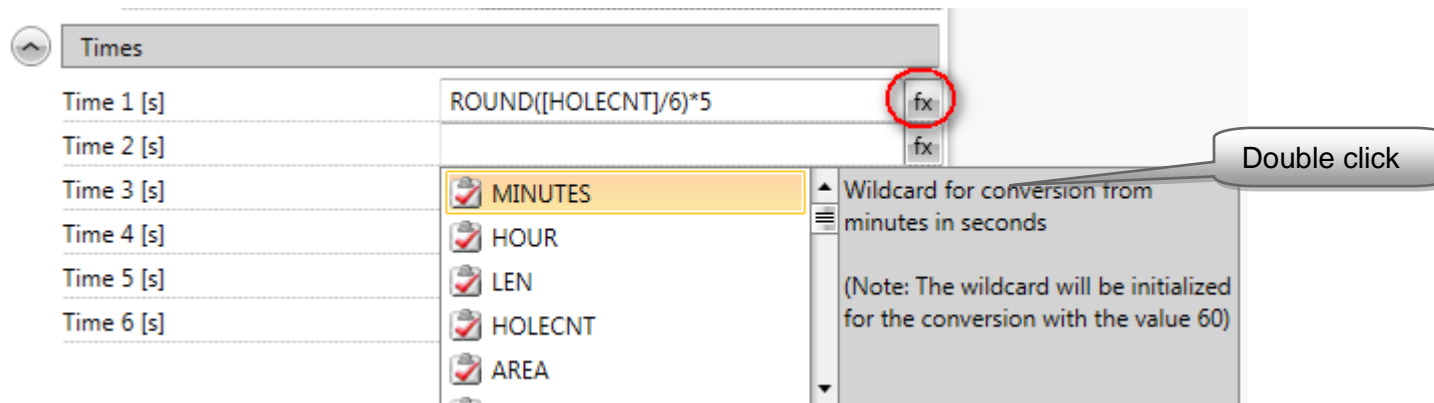
Function	Explanation
Time n	<p>The total time for the work step is the sum of the time. The setup-, process- and share time are added together as well as the calculated time from the formula fields.</p> <p> The time can also be defined via formulas. A list with all placeholders can be called via the button to simplify the definition of the formulas.</p>

3.3.1 Example for a lineboring

For the operation lineboring the following times are defined as a formula:

Name	Value
Operation	
Type	Workgroup
Comment	
Costcenter	CNC
Mark up Factor	1.00
Workgroup	
Workgroup	Lineboring
Depth Min.	1.00
Depth Max.	50.00
Diameter Min.	1.00
Diameter Max.	15.00
Orientation	Vertical
Times	
Time 1 [s]	ROUND([HOLECNT]/6)*5 fx
Time 2 [s]	fx
Time 3 [s]	fx
Time 4 [s]	fx

To simplify creating a formula, use the template from the fx-function. If you click on the fx-button the pulldown menu opens.



If one of the functions is selected from the list, a short description of the function appears on the right side. By double-clicking the highlighted function can be transferred in the field **Time n [s]**.

Explanation of the formula

The formula **round([HOLECNT]/6)*5** for the lineboring is composed of:

- **round** is that the result of **([HOLECNT]/6)** is rounded
- **[HOLECNT]** is for the number of holes in a lineboring
- In this case 6 holes can be drilled in a operation and therefore the number of holes is divided by **6**
- A drilling process lasts 3 seconds and therefore the rounded result is multiplied by 5.



You find a detailed description of the wildcard characters and their functions in the chapter **Formula editor**.

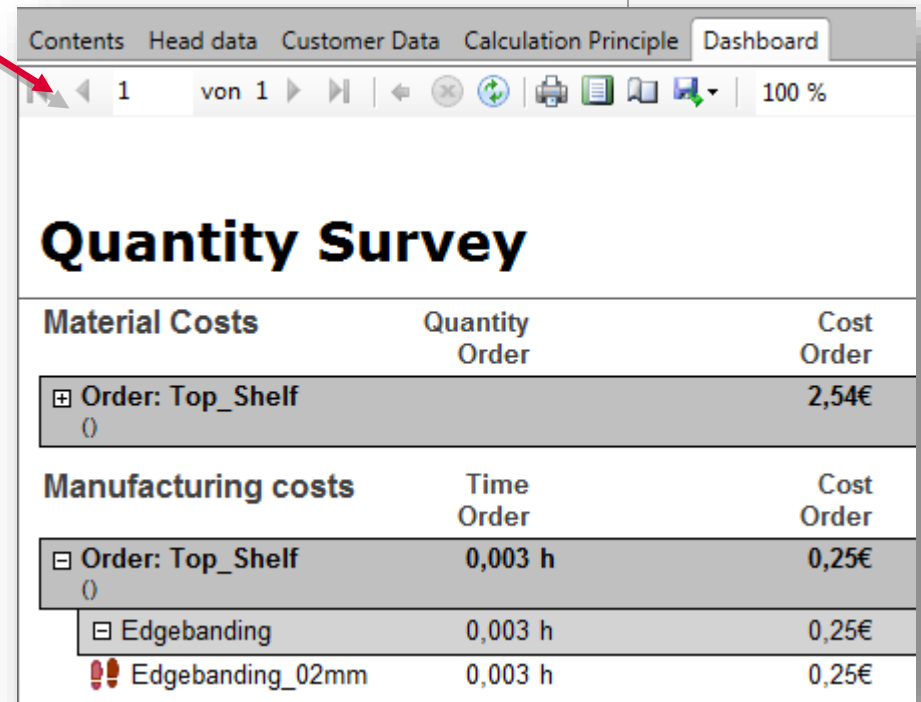
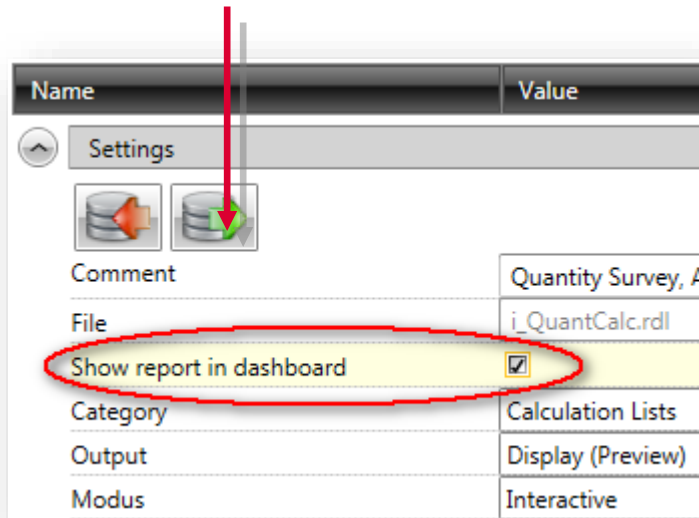
3.3.2 Example for milling rectangular pockets

For explaining the automatism of the operation type **machining**, a calculation has been performed as an example. The calculated order has only an article which consists of a top shelf.

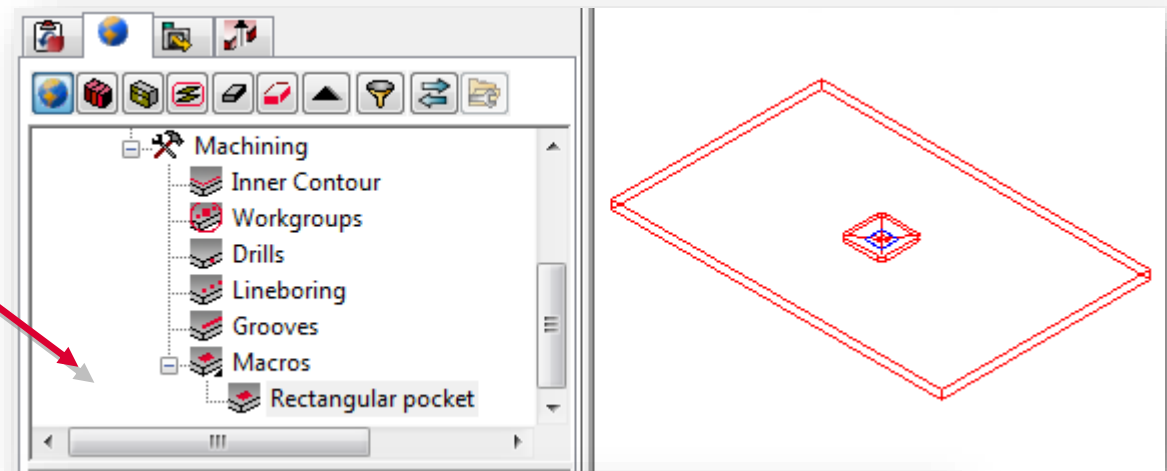
With the **first calculation** the top shelf does not have a rectangular pocket yet.



To show the **quantity survey** on the tab Dashboard, in the correspondent report the function **Show report in dashboard** has to be activated.



Before the **second calculation** was performed, a macro had been added in the shape of a rectangular pocket to the top shelf.



With the subsequent calculation the operation is automatically included in the calculation.

Manufacturing costs	Time Order	Cost Order
[-] Order: Top_Shelf ()	0,006 h	0,45€
[-] Edgebanding	0,003 h	0,25€
[-] Edgebanding_02mm	0,003 h	0,25€
[-] Machining_room_1	0,003 h	0,20€
[-] Rectangular pocket	0,003 h	0,20€

Thus, the operation is automatically taken into account for the calculation, it must be of the type **machining** and the kind of machining must accord with the machining in imos. That means that in this case it has to be a **rectangular pocket**.

Rectangular pocket

Name	Value
[-] Operation	
Type	Workgroup
Comment	
Costcenter	Machining_room_1
Mark up Factor	1.00
[-] Workgroup	
Workgroup	Rectangular Pockets

Calculation elements in the Element Manager

The operation for a rectangular pocket is described with the time formula “ **$[(AREA)/10000]*12$** “.

The formula is composed of the following parameters:

- **[AREA]** is for the area of the rectangular pocket
- The machining center needs about 12 seconds to mill a rectangular pocket to a size of 10.000mm² (is equivalent to 1dm²)

Times		
Time 1 [s]	$[(AREA)/10000]*12$	fx
Time 2 [s]		fx
Time 3 [s]		fx

In this example the rectangular pocket has a width and a depth of 100mm, this results the following calculation:
 $10.000 / 10.000 \times 12\text{sec} = \mathbf{12\text{sec}} \quad \approx \mathbf{0,2\text{min}} \quad \approx \mathbf{0,003\text{h}}$

For the **machine_room_1 60 €/h** are defined for the costs.

This results additional costs for this order of **0,20€**.

Manufacturing costs	Time Order	Cost Order
☐ Order: Top_Shelf 0	0,006 h	0,45€
☐ Edgebanding	0,003 h	0,25€
🔧 Edgebanding_02mm	0,003 h	0,25€
☐ Machining_room_1	0,003 h	0,20€
🔧 Rectangular pocket	0,003 h	0,20€

3.3.3 Formula editor

Following placeholders and function are implemented:

Placeholder for formula fields:

Placeholder	Explanation
[MINUTES]	Placeholder for the conversion from minutes to seconds.
[HOUR]	Placeholder for the conversion from hours to seconds.
[LEN]	Length for profile contours
[HOLECNT]	Number of holes for lineboring
[AREA]	Area for circular pockets or rectangular pockets
[NUTLEN]	Groove length
[ARTICLEWIDTH]	Article width
[ARTICLEDEPTH]	Article depth
[ARTICLEHEIGHT]	Article height
[CLEN]	Part length (cutting dimensions)
[CWIDTH]	Part width (cutting dimensions)
[CTHK]	Part thickness (cutting dimensions)
[FLEN]	Part length (finished dimension)
[FWIDTH]	Part width (finished dimension)
[FTHK]	Part thickness (finished dimension)
[RLEN]	Part length (raw dimension)
[RWIDTH]	Part width (raw dimension)
[RTHK]	Part thickness (raw dimension)

These placeholders can be combined with the following mathematical functions.

Functions for formula fields

Placeholder	Explanation
abs(x)	Absolute value of x
acos(x)	Arc cosine of x
asin(x)	Arcsine of x
atan(x)	Arc tangent of x
atan(y,x)	arc tangent of (y/x)
bog2deg(x)	Converts radian measure to degree measure (*180/PI)
cos(x)	Cosinus of x
deg2bog(x)	Converts degree measure to radian measure (*PI/180)
in2mm(x)	Converts Inch to mm
ln(x)	Natural logarithm of x for base e=2.718.
log(base,x)	Logarithm of x for base
log10(x)	Logarithm of x for base 10
max()	Max (a1, a2, ...) Maximum of all arguments ai
maxunder()	maxunder(x,a1,a2,...) Maximum of all arguments ai, that is <x
min()	min(a1, a2, ...) Minimum of all arguments ai
minover()	minover(x,a1,a2,..) Minimum of all arguments ai, that is >x
mm2in()	Converts mm to Inch
nextto()	nextto(x, a, a2, ...) The argument ai which has the smallest difference to x
pi()	PI = 3.141...
pow()	pow(base,ext) base high ext. Identical with base^ext
round()	round(x,base) => rounds x to n*base round(x) => round(x,1)
sin()	Sinus von X

sqr()	sqr(x) square root of x
tab()	tab(x,v1,x1,v2,...,xn,vn) searches for xi>x and provides vi or vn if x>xn
tan()	Tangent of X

Furthermore the default functions can be applied as:


Placeholder	Explanation
+	Add
-	Subtract
*	Multiply
/	Divide

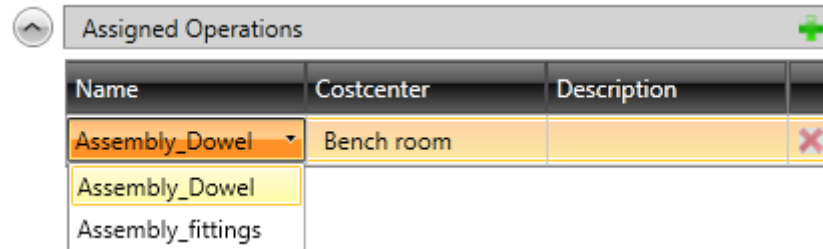
3.4 Routings

The routings are arranged level for work steps.
Routings consists of one or several work steps.

Function	Explanation
Type	The type of the routing is important for the following allocation to the imos object.
Comment	Freely editable text field.
Assignment routing	<p>Following options are available:</p> <ul style="list-style-type: none"> • Assign automatically the routing is automatically allocated to all elements corresponding with the type of the routing. • Assign due to conditions the routing is automatically allocated to all elements corresponding with the type of the routing. The allocation is restricted with the set filter below. • Assign individually the routing is individually allocated to the different imos elements.
Elements assigned to this routing	<p>This function is active if the option Assign due to conditions has been activated with the allocation routing. An element can be added via the green plus.</p> <p>The selection depends on the type of the routing.</p>
Conditions	<p>This function is active if the option allocate via conditions has been activated with the allocation routing. A condition can be defined via add condition.</p> <p>The selection depends on the type of the routing.</p>

Assigned operations

Click on the small  on the right next to **allocated work steps** to define a work step. In doing so, a new grid appears. In this grid work step can be selected under **name** via the pulldown menu.



Several work steps can also be allocated.

3.4.1 Define conditions for routings

Via the **Add Condition** button the display changes in the dialog.

The condition consists of the **field description**, the **condition** and a user-definable **value**.

The available **field descriptions** depend on the selected type.

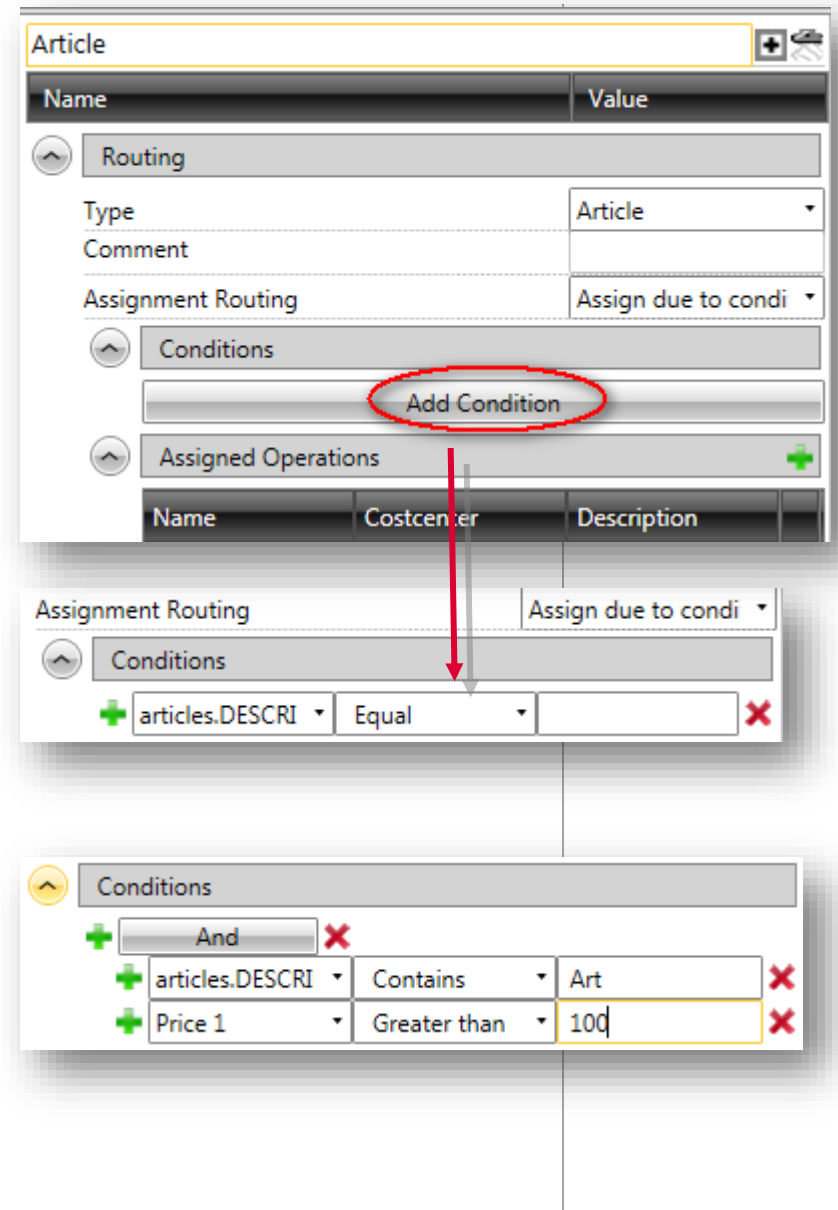


Via the **+** a new criteria can be added.

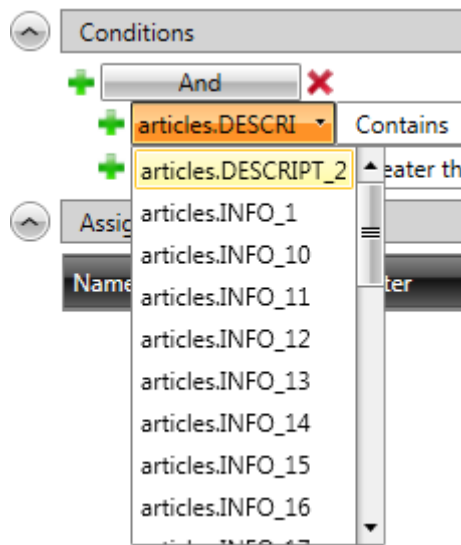
Different criteria with an **AND**, **OR**, **negated AND** or **negated OR connections** can be combined.

All filter criteria must be fulfilled with the **AND**-connection.

One of the applied conditions must be fulfilled with the **OR**-connection.



Calculation elements in the Element Manager



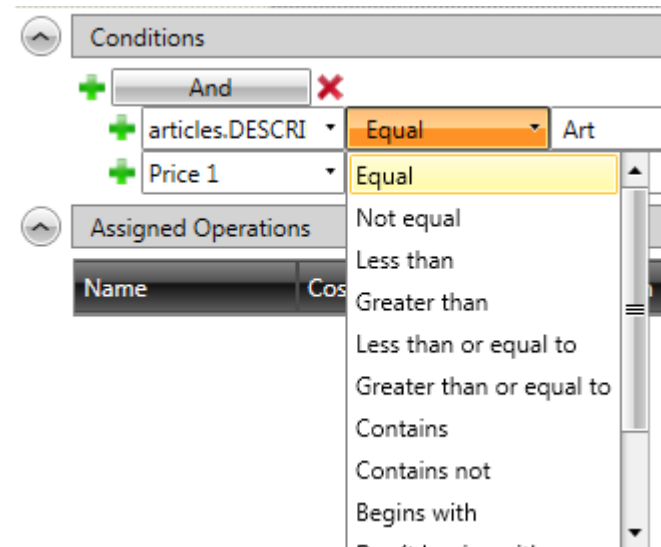
The **Field Description** to be searched can be selected via the left pulldown menu.

The **operator** can be defined via the right pulldown menu.

Then the freely definable value is entered in the text field on the right. Number values as well as text values can be used.

Details to this is in **3.4.2 Available operator**.

All combined together is the condition.



3.4.2 Available operators

Condition	Explanation Search result
Equal	Only one element can always be found because the exact name has to be searched.
Unequal	All other elements are found as the entered search term.
Less than	The values can be numerically as well as alphabetically entered here.
Greater than	The values can be numerically as well as alphabetically entered here.
Less or equal	The values can be numerically as well as alphabetically entered here.
Greater or equal	The values can be numerically as well as alphabetically entered here.
Contains	No Wildcard characters are allowed to be entered here. Orders are found containing the entered criteria.
Does not contain	All orders are found which are not found with "contain".
Begins with	The beginning of the search term must be entered -without Wildcard character-.
Does not begin with	All orders are found which are not found with "begins with".
Ends with	The end of the search term must be entered -without Wildcard character-.
Does not end with	All orders are found which are not found with "ends with".



No wildcard characters are allowed with the conditions.

Calculation elements in the Element Manager

3.4.3 Add conditions

Conditions can be combined in different ways. Depending on combination and placement various results arise.

It is also possible to combine different conditions.
Pay attention to the level at which it is inserted.







How to define the different levels?

Start with the definition of the first condition:







Click on the green plus. That results the following situation:

Calculation elements in the Element Manager

If you click on the upper plus (a), a further criterion is inserted on the same level.

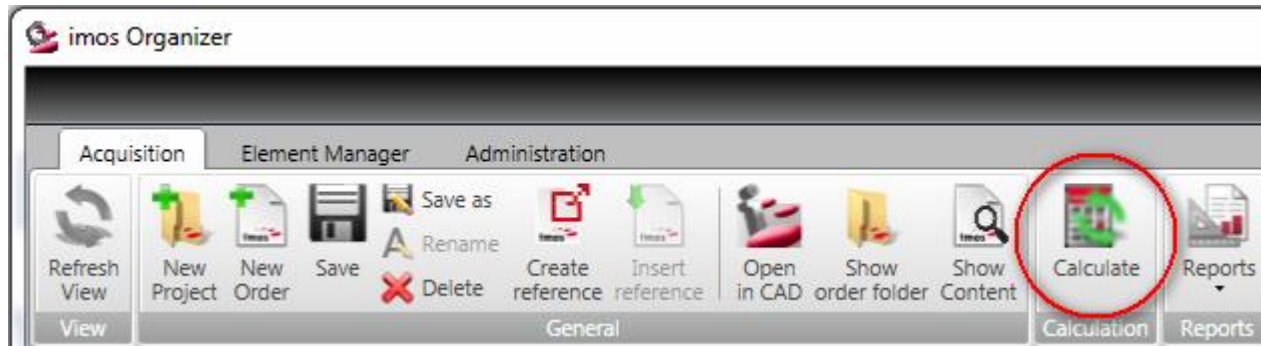
 And 			
 articles.DESCRPT_2	Contains	Art	
 articles.DESCRPT_2	Contains	01	

If you click on the lower plus (b), a further condition is inserted:

 And 			
 And 			
 articles.DESCRPT_2	Contains	Art	

4. Perform a calculation

To calculate the costs you have to choose the function **Calculate** in the menu.



The result of the calculation can be displayed in different places.

1. On the tab **Content** the total costs are displayed.
2. On the tab **Orderlines** a detailed description of the calculation is displayed.
3. The quantity survey can also be displayed on the Dashboard.



Which kind of calculation is used, can be defined via the selected calculation principle.



After changing the calculation principle or single order-based settings, the calculation must always be manually restarted to apply the setting.

5. Calculation types

5.1 Material overhead calculation

The material overhead calculation is shown on the tab **Orderlines** if this type of calculation has been defined in the **calculation principle**.

The tab **Orderlines** can be activated by double-clicking an order on the tab **Contents**.

For the material overhead calculation the price is calculated as follows:

$$\text{Direct material costs} \times \text{Material overhead factor} / 100$$

Contents Head data Customer Data Calculation Principle Dashboard

Principle name Material overhead calc

Name	Value
Overhead Calculation	
Material overhead calculation	
Material overhead factor	300,00
Catalog price calculation	
View price fields	
Price field from	Material overhead calculation

Calculation types

5.1.1 Example for a material overhead calculation

The example order consists of one article which has only a part- a top shelf.

- The part has a raw dimension of **800 mm x 600 mm** (0,8 m x 0,6 m)
- There is **no** surface
- **No** connectors or SPP are used
- There is only a profile on **edge 1**

Following prices have been stored:

- Material = 19 €/m²
- Profile = 5 €/m

In this case, the material costs are calculated as follows:

Material costs:

0,8 m x 0,6 m = 0,48 m²
 0,48 m² x 19 €/ m² = 9,12 €

Profile costs:

0,8 m x 5 €/ m = 4,00 €

Direct material costs (DMC):

Profile + Material
 9,12 € + 4,00 € = **13,12 €**


Material Costs	Quantity Order	Cost Order
☐ Order: Top_Shelf ()		13,12€
☐ Material	0,48 m ²	9,12€
☐ PB19_MEL_BE	0,48 m ²	9,12€
☐ Profile name	0,80 lfm	4,00€
☐ ABS_BE_2mm	0,80 lfm	4,00€

The **Material overhead factor** was defined in the calculation principle with **300!**

The **costs** are as follows:

Direct material costs	x	Material overhead factor / 100)	
13,12€	x	300/100	= 39,36€

That results the following information on the tab **Orderlines**:

Orderlines														
Head Data Customer Data Calculation Principle Dashboard														
Pictu	Hierarchy	Positio	Name	Quantity	Cost	Original SP	Discount	Discount	SP Piece	Total SP	VAT %	Sales Tax	Margin	Gross Price
	001	001	Top_Shelf		39,36 €	39,36 €	0,00 %	0,00 €	39,36 €	39,36 €	19,00 %	7,48 €	0,00 %	46,84 €

- In the material overhead calculation, the **cost** is the **Original SP**.
- Since no discount has been defined, the **Original SP** is corresponding to the **SP Piece**.
- Quantity =1, this results a **Total SP** of **39,36 €**.
- The value added tax (VAT in %) can be defined via the customer.
if no customer is assigned, then the default VAT will be used.

This results the **Sales Tax**:

$$39,36€ \times 19/100 = 7,4784 \quad \approx 7,48 \text{ €}$$

And the **Gross Price** is calculated as follows:

Total SP	+	Sales Tax	
39,36€	+	7,48 €	= 46,84€

5.2 Overhead calculation

The overhead calculation is shown on the tab **Orderlines** if this type of calculation has been defined in the **calculation principle**.

The diagram illustrates which factors are applied for the overhead calculation:



Contents Head data Customer Data Calculation Principle Dashboard

Principle name Overhead_calc

Name	Value
Overhead Calculation	
Material Overhead Cost	15,00
Manufacturing Overhead Cost	10,00
External Manufacturing Cost	0,00
Profit	10,00
Commission	5,00
Administration/Distribution Overhead	1,00
Special Distribution Cost	1,00
Trade Discount	1,00
Material overhead calculation	
Catalog price calculation	
View price fields	
Price field from	Overhead Calculation

Calculation types

5.2.1 Example for an overhead calculation

The example order consists of one article which has only a part- a top shelf.

- The part has a raw dimension of **800 mm x 600 mm** (0,8 m x 0,6 m)
- There is **no** surface
- **No** connectors or SPP are used
- There is only a profile on **edge 1**

Following prices have been stored:

- Material = 19 €/m²
- Profile = 5 €/m

On this basis the following calculations are:

5.2.1.1 Material costs

At first the **Direct material costs** must be added together with the **Material Overhead Cost** for the material costs.

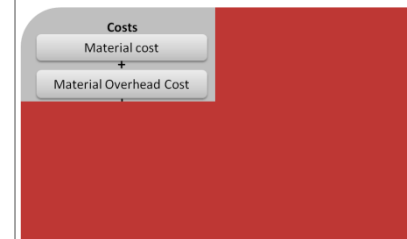
Costs material:

$$0.8 \text{ m} \times 0.6 \text{ m} = 0.48 \text{ m}^2$$

$$0.48 \text{ m}^2 \times 19 \text{ € / m}^2 = 9,12 \text{ €}$$

Costs profile:

$$0.8 \text{ m} \times 5 \text{ € / m} = 4,00 \text{ €}$$



Calculation types

**Direct material costs (DMC):
profile + material**
9,12 € + 4,00 € = 13,12 €



The material costs can be displayed via the Quantity Survey.

Material Overhead Cost (MOC):
MOC x % from calculation principle (i.e. 15%)
13,12 € x 0,15 = 1,968 €

Complete material costs
DMC + MOC
13,12 € + 1,968 € = 15,088 €

Material Costs	Quantity Order	Cost Order
Order: Top_Shelf ()		13,12€
Material	0,48 m ²	9,12€
PB19_MEL_BE	0,48 m ²	9,12€
Profile name	0,80 lfm	4,00€
ABS_BE_2mm	0,80 lfm	4,00€

Contents Head data Customer Data Calculation Principle Dashboard

Principle name Overhead_calc

Name	Value
Overhead Calculation	
Material Overhead Cost	15,00
Manufacturing Overhead Cost	10,00
External Manufacturing Cost	0,00
Profit	10,00
Commission	5,00
Administration/Distribution Overhead	1,00
Special Distribution Cost	1,00
Trade Discount	1,00
Material overhead calculation	
Catalog price calculation	
View price fields	
Price field from	Overhead Calculation

5.2.1.2 Manufacturing costs

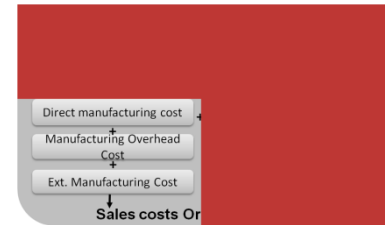
The manufacturing costs result from routings allocated to the part.

The routings can be stored on different levels of the part.

The routing consists of one or several operations which have access to a cost center again.



The manufacturing costs can be displayed via the Quantity Survey.



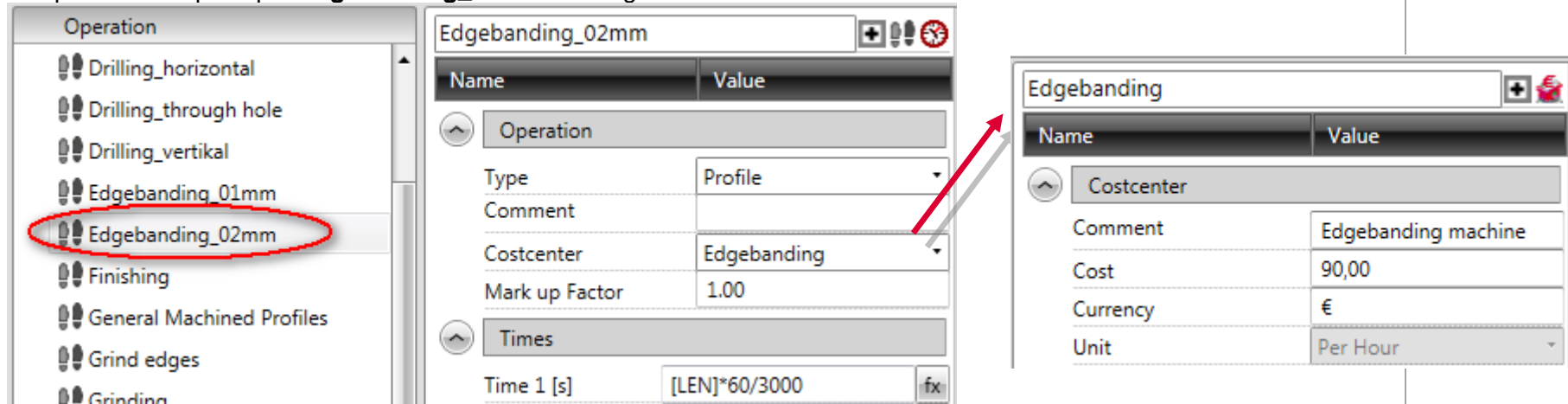
In this case the routing **Edgebanded_profiles_02mm** was set up. This has the following properties:

Name	Value	
Routing		
Type	Profile	
Comment		
Assignment Routing	Assign automatically	
Assigned Operations		
Name	Costcenter	Description
Edgebanding_02mm	Edgebanding	

For this routing the assignment of the routing is set on **Assign automatically**. That means that the routing is assigned automatically to all imos elements that correspond with that type.



As operation the principle **Edgebanding_02mm** is assigned.



This results the following calculation for the **manufacturing costs**:

Direct manufacturing cost (DMC):

time 1	x	Costs of the cost center
16 sec	x	90 €/h
0,004h	x	90 €/h = 0,40 €

Manufacturing costs

	Time Order	Cost Order
Order: Top_Shelf	0,004 h	0,40€
Edgebanding	0,004 h	0,40€
Edgebanding_02mm	0,004 h	0,40€

Manufacturing Overhead Cost (MOC)

DMC	x	Manufacturing Overhead Cost in % from the calculation principle (10%)
0,40 €	x	0,1 = 0,04 €

Production costs:

DMC + MOC
0,40 € + 0,04 € = 0,44€



External Manufacturing Costs were not defined via the calculation principle.

Overhead Calculation	
Material Overhead Cost	15,00
Manufacturing Overhead Cost	10,00
External Manufacturing Cost	0,00

Calculation types

5.2.1.3 Costs

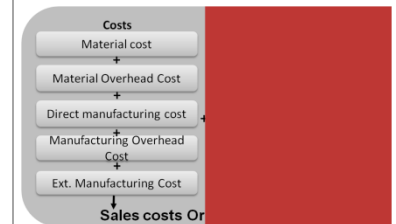
For the calculation of the costs the material costs have to be added with the manufacturing costs.

Material costs + **Manufacturing costs**
 15,088 € + 0,44 € = **15,528 €** ≈ 15,53€



The **costs** are displayed on the tab Orderlines in the column with the same name.

Orderlines						
Head Data						
Customer Data						
Calculation Principle						
Dashboard						
Pictu	Hierarchy	Position	Name	Quantity	Cost	Original SP
	001	001	Top_Shelf		15,53 €	17,99 €



5.2.1.4 Overhead

The overheads are calculated from the percentages of the calculation principle.

Profit:

Costs x % from the calculation principle (10 %)
 15,53 € x 0,10 = **1,553 €** ≈ 1,55

Commission:

Costs x % from the calculation principle (5 %)
 15,53 € x 0,05 = **0,7765 €** ≈ 0,78

Administration/Distribution Overhead:

Costs x % from the calculation principle (1 %)
 15,53 € x 0,01 = **0,1553€**

Special Distribution Cost:

Costs x % from the calculation principle (1 %)
 15,53 € x 0,01 = **0,1553€**

This result the following **total overheads:**

Profit + **Commission** + **Administration/Distribution Overhead** + **Special Distribution Cost**
 1,553 € + 0,7765 € + 0,1553 € + 0,1553 € = **2,6401 €**

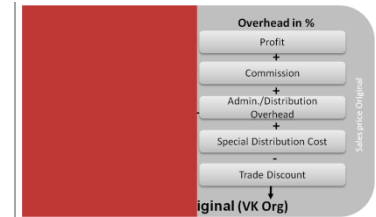
Trade Discount:

(Cost + overhead) x % from the calculation principle (1 %)
 (15,53 € + 2,6401 €) x 0,01 = **0,1871**

5.2.1.5 Original Sales Price

For the **Original Sales Price** (Original SP) the costs and the overheads are added:

Costs + **Overhead** - **Trade Discount**
 15,53€ + 2,6401 € - 0,1871 € = 17,983 ≈ **17,99 €**



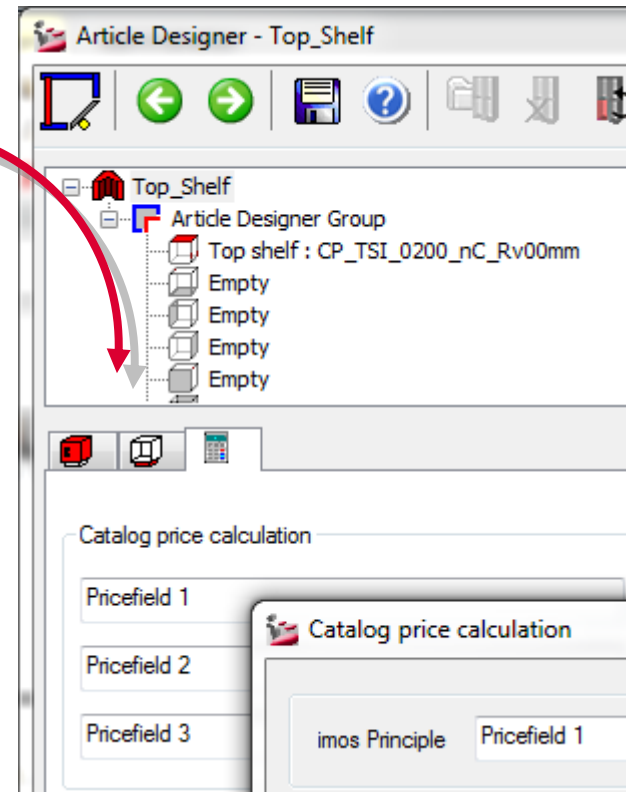
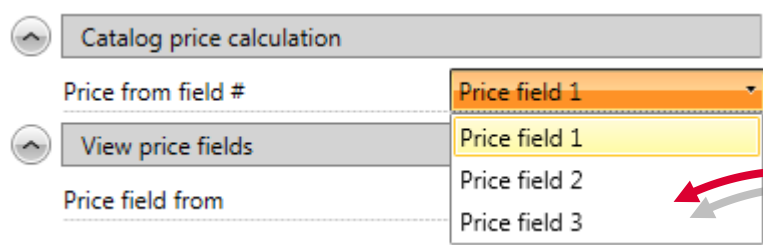
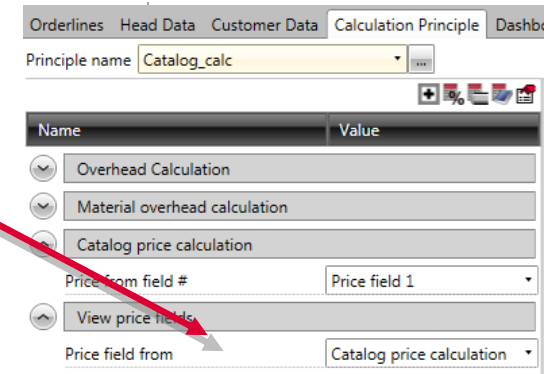
Orderlines									
Head Data									
Customer Data									
Calculation Principle									
Dashboard									
Pictu	Hierarchy	Position	Name	Quantity	Cost	Original SP	Discount		
	001	001	Top_Shelf	1	15,53 €	17,99 €	0,00 %		

5.3 Catalog price calculation

The catalog price calculation is shown on the tab **Orderlines** if this type of calculation has been defined in the **calculation principle**.

The price is defined via the catalog price fields in the **Article Designer**.

The following three price fields are available. Which field is used can be defined via the field Price from field # in the **Calculation Principle**.



The catalog price calculation in the Article Designer is optional in imos.

5.4 Quantity Survey

The quantity survey can be executed on the tab dashboard, if the correspondent report was activated in the Element Manager via the function **Show report in dashboard**.

The **quantity survey** is equivalent to the **calculation material and time** in the Organizer version 4.0.

By changing to the tab, the quantity survey is directly performed, if the order was previously calculated once.

The calculation is displayed in a report.

This report is divided into 2 sections:

- Material costs
- Manufacturing costs

Material Costs	Quantity Order	Cost Order	Quantity Orders	Quantity Total	Cost Total
[-] Order: Modern_kitchen		612,98€	1		612,98€
[-] Material	15,97 m ²	270,58€	1	15,97 m ²	270,58€
[-] Profile name	68,48 m	342,40€	1	68,48 m	342,40€
[-] Connector	237 Stk.	0,00€	1	237 Stk.	0,00€
[-] Color Principles	25,23 m ²	0,00€	1	25,23 m ²	0,00€

Manufacturing Costs	Time Order	Cost Order	Quantity Orders	Time Total	Cost Total
[-] Order: Modern_kitchen	2,813 h	271,42€	1	2,813 h	271,42€
[-] Cut	2,281 h	205,28€	1	2,281 h	205,28€
[-] CNC	0,152 h	31,91€	1	0,152 h	31,91€
[-] Edgebanding	0,380 h	34,24€	1	0,380 h	34,24€

With the quantity survey the pure **material costs** and the **expenditure of time** are added together to one price. This calculation type does not depend on the calculation principles.

